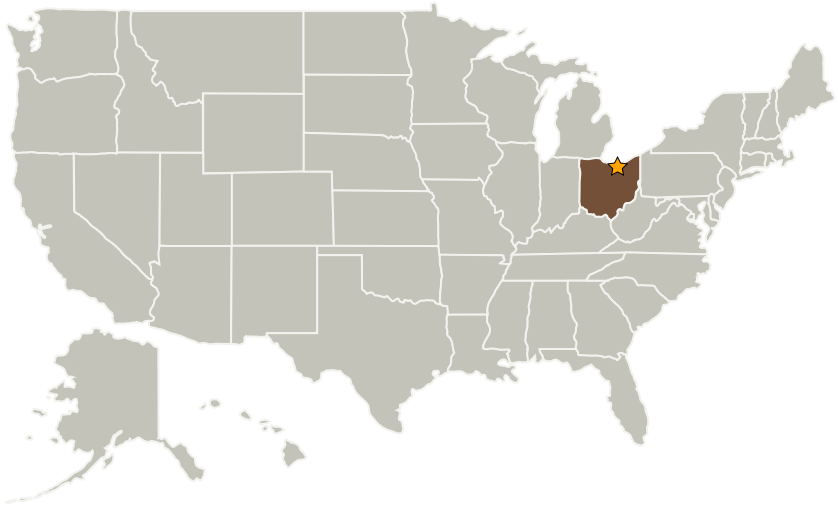
In-Service Aircraft Transmission Life Modeling for Improved Flight Safety, Phase I

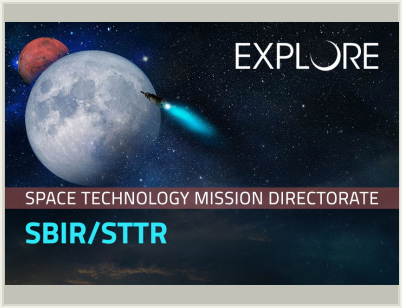
Completed Technology Project (2004 - 2004)

Project Introduction

It is proposed to develop an accurate, in-service transmission life-estimation system for the prediction of remaining component and system life for a helicopter transmission system. Once proven in the helicopter environment, this life-estimation system will be of use to a wide variety of airborne and land-based transmission systems. Its use will improve the safety and reduce the maintenance costs of the monitored systems. The transmission-life estimating system will include three separate algorithms: an in-flight service monitoring algorithm, a pre-flight and post-flight transmission analysis algorithm, and a component-life tallying algorithm. The in-flight service monitor will treat the transmission as a whole in response to sampling data of mast torque and speed. The transmission analysis algorithm will determine the transmission's operating parameters from those of its components. It also will determine the life and reliability of the individual components based on the service monitoring algorithm's output. The component-life algorithm will accumulate life and reliability tables. The Phase I effort will develop the life-monitoring and supporting life-estimation and reliability algorithms. In the Phase II effort, the full life-estimating system will be assembled and tested with a helicopter main-rotor transmission.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Nastec, Inc.	Supporting Organization	Industry	Brook Park, Ohio

Primary U.S. Work Locations
Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Richard Klein

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.2 Distribution and Transmission